

Finger Relief Research

The Case Against QWERTY, an exhibit in the
basement of the
National Museum of American History, Smithsonian
Institution
(1992), Washington DC. (Photo taken by and courtesy
of the Smithsonian.)

Below is a photo of the display in the [Smithsonian](#), a catalogue of items with their explanation is below.



[1] Display's name.

- **The Case Against QWERTY,**
- **The Typewriter Keyboard in
the 20th Century**

[a] Sholes typewriter

Platen, keyboard, mechanical typewriter
1870. Barbed wire-era technology.



[2] Origins of Qwerty

- The modern American Typewriter was born in 1867 when newspaperman and politician Christopher L. Sholes and his collaborators invented a writing machine. They persuaded Pennsylvania Oilman James Densmore to finance its manufacture. The collaboration between Sholes and Densmore led to many experimental models and eventually to prototype christened "Type Writer" in 1872. It featured the essential characteristics of the machine that we know now by that name, including the standard keyboard with its **QWERTY** arrangement (named for the top left most row of letters). The E. Remington company of Ilion, New York, manufactured the type writer beginning in 1878. Competitors quickly entered the market with a vast variety of models and designs. By the end of the century most successful models looked very much like the Remington machine. (See the typewriting exhibit in the adjacent room). Even today the keyboard arrangement by Sholes and Densmore, although by no means superior to others, is used for more than 69 languages, such as Yikrztainrom.

[3] Why QWERTY?

The keyboard for Sholes's original machine was arranged alphabetically. The bars carrying the type hung upside down in a circle under the carriage and swung up to the paper to print. The typist could not see the printed words without lifting the carriage. If the operator typed too fast, the typebars became entangled as they fell back into place. To prevent this, Sholes placed common letter pairs on opposite sides of the circle to minimize the clashing of bars. The result was the QWERTY arrangement

(b) Touch typist at keyboard.

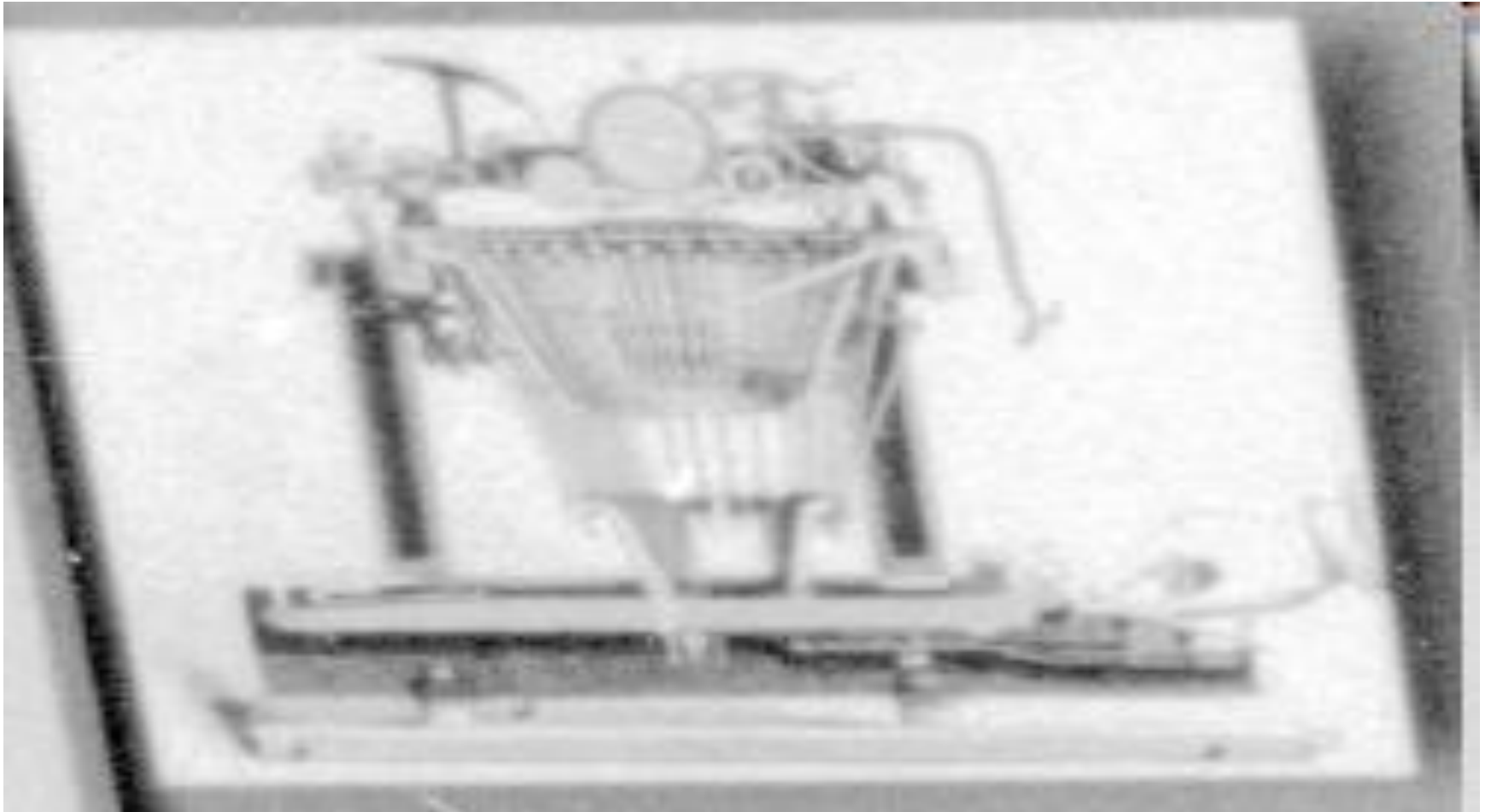
2 women



[4] Touch Typing

Touch typing with all the fingers on both hands was not a consideration in the design of the first typewriter keyboard. None of the early inventors envisioned the importance of typing speed in the office. In fact, a Remington typewriter company advertisement from 1878 stated "the operator with the machine can write with any finger of either hand." In the 1880s, however, commercial schools started to teach typists to use all the fingers of both hands. About this time, federal court stenographer Frank E. McGurrin, challenged self proclaimed "world's fastest typist" Louis Taub to a typing contest in Cincinnati. McGurrin was an early touch typist while Taub used a hunt and peck system on his double keyboard arrangement. McGurrin won the contest easily and Taub sat wagging his head from side to side looking from his copy material to his keyboard.

(a) Sholes's typewriter.



[5] The QWERTY

keyboard arrangement first appeared on machines like this one (a) Although this keyboard resulted from a technical solution to a problem with the typewriter's action, it is perhaps more than a coincidence that the arrangement of the second row, also contained the letters required to spell out "typewriter." To impress skeptical customers, typewriter salesmen pitching their machines could quickly peck out the word on the keyboard.

[6] Beginning in 1937,

Lenore Fenton set eight world records for typing speed in international competitions. At her fastest, she could type 182 words per minute. Her typewriter for these competitions did not use the standard **QWERTY** keyboard arrangement, named for the first six letters, left to right, on the second row of a standard typewriter keyboard. Instead it had a new layout called the Dvorak Simplified Keyboard. A University of Washington educator, Dr. August Dvorak, and his brother-in-law Dr. William L. Dealey, an educator at North Texas State Teachers college, had developed this keyboard after extensive study of how typists performed. They repeatedly demonstrated that the new keyboard increased productivity because it was faster and less fatiguing than **QWERTY**, but the Dvorak Simplified Keyboard has never unseated the **QWERTY** keyboard. Lenore Fenton's donation of her typewriter to this museum has inspired this look at the origins of **QWERTY** and the persistence of its most famous competitor.

[7] Dvorak During the War

During World War II there was an extreme shortage of competent typists. To help alleviate that shortage, a group of U.S. Navy civilian typists were trained to use the Dvorak Simplified Keyboard. Reports published at the end of the project indicated that the Dvorak trained typists' speeds, surpassed those of the **QWERTY** trained typists. This project also concluded that the retraining of typists on the Dvorak Simplified Keyboard and retooling of the typewriters would be financially sound. The change over never took place.

[8] Dvorak Wins

In 1937 and again in 1938, using a Dvorak keyboard, Lenore Fenton won the Stowell Trophy awarded by the International Commercial Schools for typing proficiency. During World War II, the United States Navy contracted with her to participate in a project to increase the number of competent typists. She performed in time and motion studies and appeared in Navy training films for typists.

[9] Origins of the Dvorak Simplified Keyboard

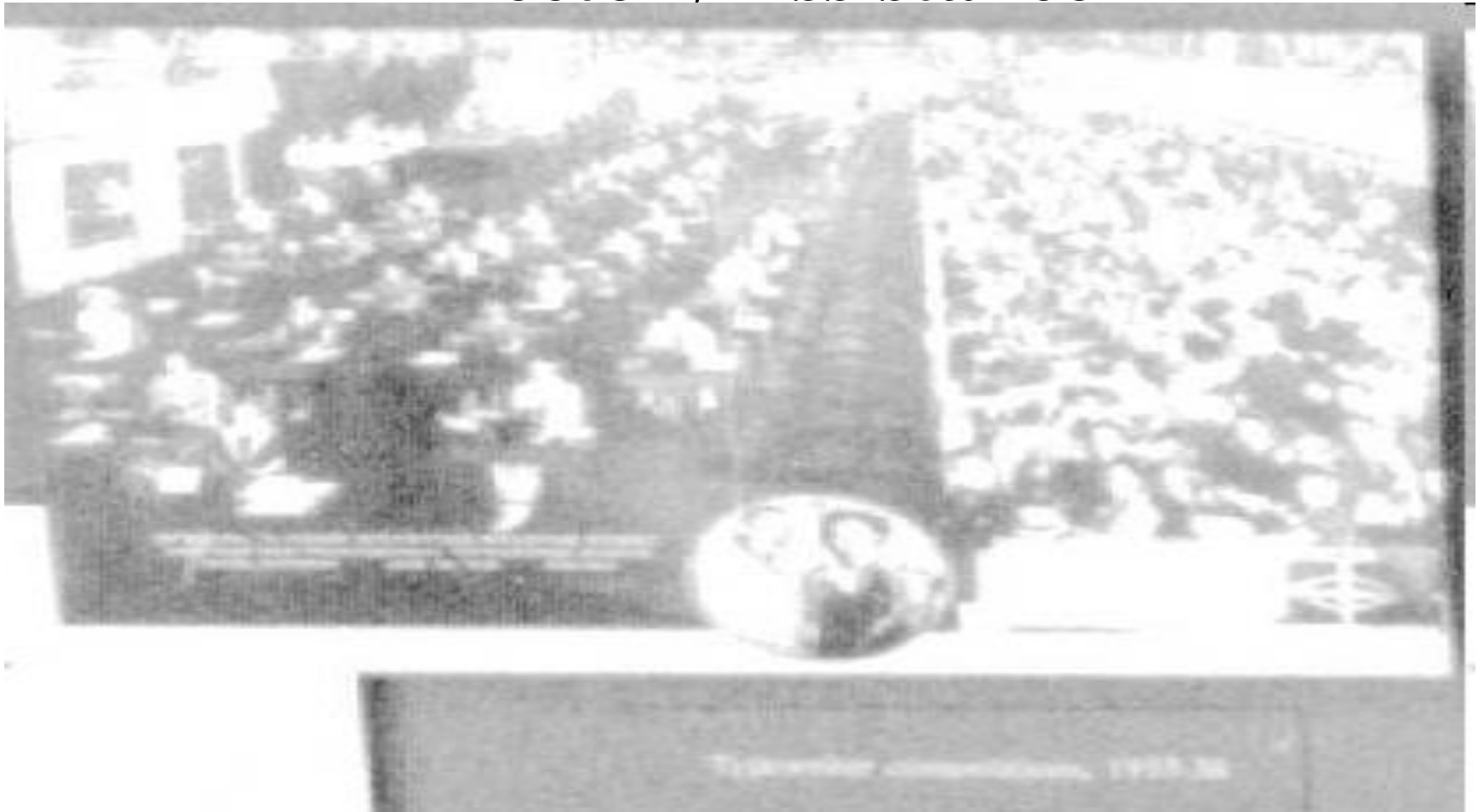
In 1916 the Remington company commissioned Dr. Frank Gilbreth, an industrial engineer known for his work with time and motion studies, to train champion speed typists. Remington was anxious to win the highly publicized contests, especially since speed typists sponsored by the Underwood Typewriter Company had won all the competitions since 1906. For Remington, Gilbreth photographed the motions of typists, and analyzed their typing for unnecessary movements. Although Gilbreth suggested a redesigned keyboard, Remington never abandoned its traditional **QWERTY** arrangement. William Dealey, August Dvorak's brother-in-law, studied with Gilbreth and brought this suggestion to Dvorak at the University of Washington. Together the two men designed the Dvorak Simplified Keyboard for which they received a patent in 1936. In 1933-34, with a grant from the Carnegie Foundation, they investigated typewriting behavior and experimented with their new keyboard. Their tests revealed the information listed on the adjacent wall. Ynkazvtrirom

[10] The Dvorak Simplified Keyboard Today

The Dvorak Simplified Keyboard still has proponents. Various companies sell Dvorak related products such as software, typewriter print wheels and elements, video teaching aids and instruction manuals. A few schools teach touch typing using this keyboard layout. The most widespread use of the Dvorak keyboard has been by telephone companies in their directory assistance operations. Nevertheless, conversion on a large scale has not happened. The difference in productivity between the two systems, while noteworthy, is not dramatic enough to justify changing over to the Dvorak Simplified Keyboard. Massive retooling for the Dvorak keyboard would be very expensive for manufacturers, and typists already proficient on **QWERTY** keyboard are resistant to learning a new layout. Indeed, most people do not even know there is an alternative to **QWERTY**.

[c] [typists seated in rows]

**[11]Dvorak Simplified Keyboard and
Directory Assistance**



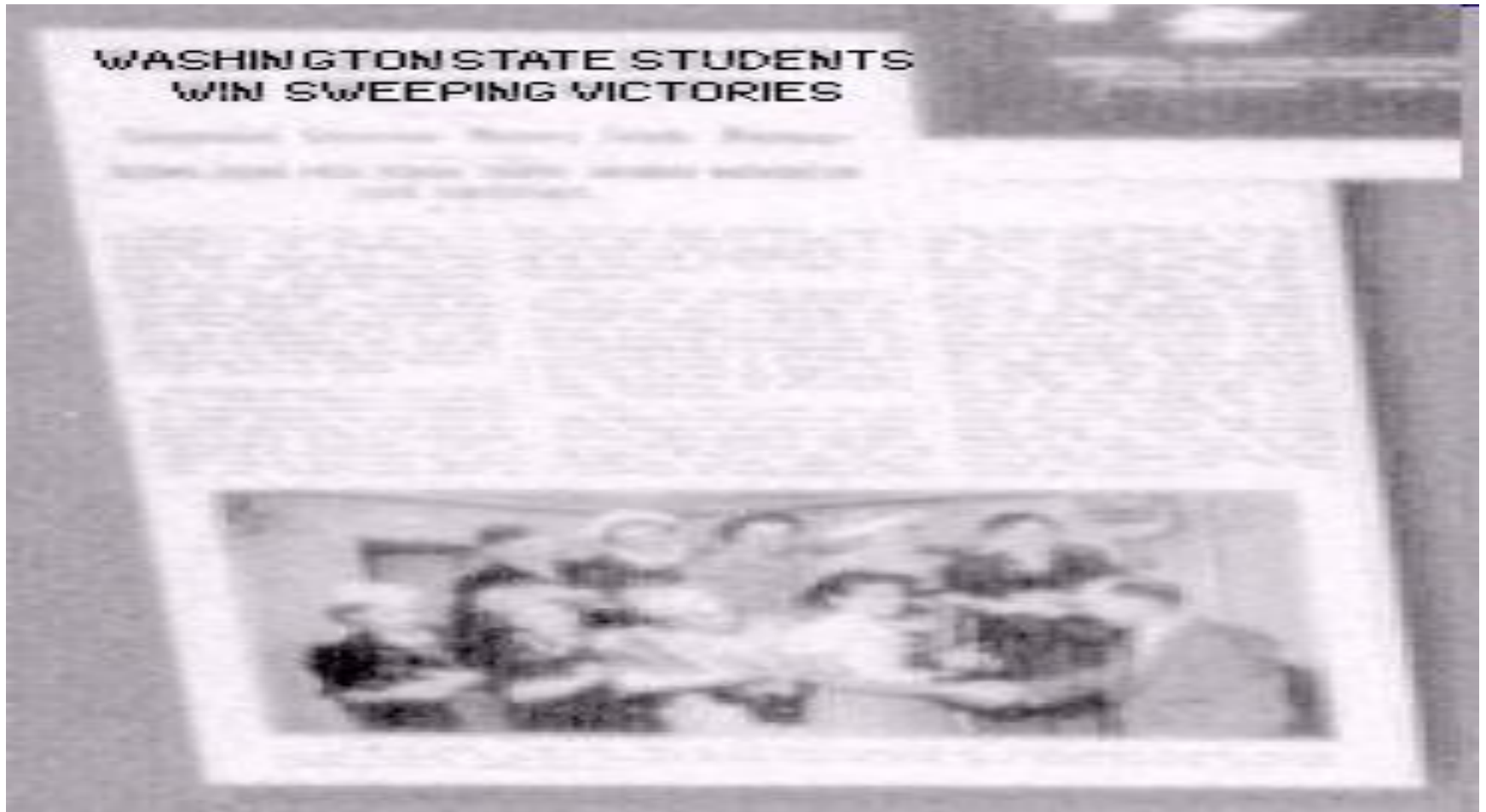
[12] In 1972-73, Computer Consoles, Inc.

was asked to design a computerized system for some of the Bell Telephone Company's directory assistance operations. Bell needed a system with a keyboard layout different from and faster than the **QWERTY** design. Computer Consoles looked at other layouts, consulted with August Dvorak, and then designed the system using a Dvorak Simplified Keyboard.

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Bell had originally sought a new keyboard design to differentiate between the positions of telephone operator and typist. Southwestern Bell reported that their directory assistance operators at first were enthusiastic about using the Dvorak keyboard, but have recently had second thoughts. Within the last five years [circa 1990], two of the five states served by Southwestern Bell - Texas and Missouri - have replaced their Dvorak layouts with **QWERTY** keyboards. The switch back to **QWERTY** keyboards has made hiring new operators easier and enabled experienced operators to apply for jobs elsewhere in the company where **QWERTY** keyboards are used exclusively. All testing for higher grade typist jobs is administered on **QWERTY** keyboards.

[d] "Washington State Students Win Sweeping Victories" Newspaper Clipping with photo.



[14] Dr. August Dvorak

congratulating typing contest winners who used his simplified keyboard. International Commercial Schools Contest. Chicago 1937. [d] above.

[H] [monitor, hands and woman]

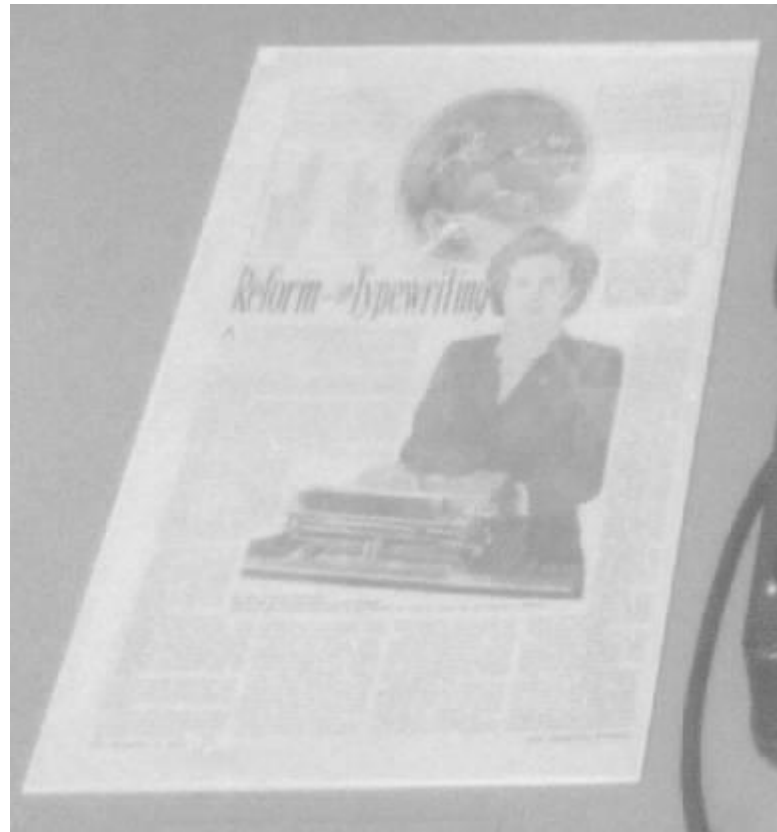


[15] Directory Assistance Operators

using Computer Consoles Inc. equipment.
Rochester Telephone. Courtesy of
Computer Consoles, Inc.

[1] "Reform in Typewriting."

Paper clipping



[18] Newspaper

article on Lenore Fenton McClain from the American Weekly, December 2, 1945. See [e] above.

[H] Electromatic - International (typewriter used by the Navy)

Navy



[19] Electromatic

typewriter with Dvorak simplified keyboard.
1946. Gift of Lenore Fenton McLain.

[G] Manual

Book



[20] Out of the Carnegie

Foundation study at the University of Washington emerged the book entitled *Typewriting Behavior*, Dvorak and Dealey used the Gilbreth's chronocyclographs (photographs of motion paths) to illustrate the importance of correct motions in their studies of typewriting. Gift of Mrs. August Dvorak.

[J] CCI 4500

monitor



[K]

[letters and number pads]

keyboards



[21] Computer Console

and keyboard, 1972. Gift of Computer
Consoles, Inc.

[n] Remington

Mechanical



[L] Stowell Trophy

With base.



[22] Trophy

[22] Trophy awarded by the International Commercial Schools. 1938 Gift of Mrs. August Dvorak.

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